Orient/East-Med Corridor: Challenges and Potentials

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Veröffentlichungsversion / Published Version
Sammelwerksbeitrag / collection article

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:
Akademie für Raumforschung und Landesplanung (ARL)

Empfohlene Zitierung / Suggested Citation:
Perić, A., & Niedermaier, M. (2019). Orient/East-Med Corridor: Challenges and Potentials. In B. Scholl, A. Perić, & M. Niedermaier (Eds.), *Spatial and Transport Infrastructure Development in Europe: Example of the Orient/East-Med Corridor* (pp. 35-70). Hannover: Verl. d. ARL. https://nbn-resolving.org/urn:nbn:de:0168-ssoar-66483-6

AKADEMIE FÜR
RAUMFORSCHUNG UND
LANDESPLANUNG

Perić, Ana; Niedermaier, Mathias:

Orient/East-Med Corridor: Challenges and Potentials

URN: urn:nbn:de:0156-0952025

S. 35 bis 70

Aus:

Scholl, Bernd; Perić, Ana; Niedermaier, Mathias (Eds.) (2019):
Spatial and Transport Infrastructure Development in Europe: Example of the Orient/East-Med Corridor.
Hannover. = Forschungsberichte der ARL 12.

Ana Perić, Mathias Niedermaier

2 ORIENT/EAST-MED CORRIDOR: CHALLENGES AND POTENTIALS

Resume

Abstract
As defined by the European Commission, the Orient/East-Med Corridor is one of the most significant European transport axes. However, it runs through states with low economic performance and poor infrastructural networks; it coincides with the Western Balkan and eastern Mediterranean migration routes; finally, administrative bottlenecks along the corridor are common practice. Despite such a status, it is one of the key areas for international investments in transport hubs and lines. Therefore, in order to find proper solutions for complex problems along the corridor, an overview of the main conditions that influence the corridor development as well as local requirements is given as follows. First, in order to clarify the strategic position of Europe against transcontinental relations, the main trade, economic and demographic statistical indicators are presented. Second, a brief overview of transport and technical conditions relevant for the countries along the corridor are indicated. Finally, a close interaction between transport and spatial development in the cities along the corridor

is briefly presented. Such a multi-scalar perspective gives a hint of the dynamics of transnational cooperation, as well as the cooperation process among many stakeholders from various domains, mainly transport and spatial planning.

Keywords
Transport – spatial planning – transnational dynamics – railway infrastructure network – urban development – Orient/East-Med Corridor

Orient/East-Med Corridor: Herausforderungen und Potenziale

Kurzfassung
Gemäß Definition der Europäischen Kommission ist der Orient/East-Med Corridor eine bedeutende Transportachse Europas. Zugleich verläuft er jedoch auch durch Staaten mit vergleichsweise geringer Wirtschaftskraft und unzureichenden Transportinfrastrukturen, außerdem überschneidet er sich mit der Migrationsroute des Westbalkans und des östlichen Mittelmeerraums. Auch Mängel in der administrativen Zusammenarbeit sind durchaus üblich entlang des Korridors. Dessen ungeachtet nimmt diese Achse eine Schlüsselstellung für internationale Investitionen in Verkehrsknoten und -achsen ein. Im Folgenden wird ein Überblick über die wichtigsten Bedingungen, die die Korridorentwicklung beeinflussen, sowie über die lokalen Anforderungen gegeben, um geeignete Strategien für die komplexen Herausforderungen entlang des Korridors aufzuzeigen. Zunächst werden die wichtigsten handels- und wirtschaftsstatistischen sowie demographischen Indikatoren dargestellt, um die strategische Position Europas gegenüber den transkontinentalen Beziehungen zu verdeutlichen. Im Weiteren wird ein kurzer Überblick über die relevanten Verkehrsinfrastrukturen und ihre Zustände in den betreffenden Ländern gegeben. Abschließend wird der enge Zusammenhang zwischen Verkehrs- und Raumentwicklung in den Städten entlang des Korridors erläutert. Diese vielschichtige Perspektive verdeutlicht die Dynamiken der transnationalen Zusammenarbeit sowie die Kooperationsprozesse zwischen vielen Akteuren aus unterschiedlichen Bereichen, hier insbesondere aus den Bereichen Verkehr und Raumplanung.

Schlüsselwörter
Verkehr – Raumplanung – transnationale Dynamiken – Eisenbahninfrastruktur und -netze – Stadtentwicklung – Orient/East-Med Corridor

1 Introduction: European policies on spatial development

The topic of spatial development has been always highly ranked among European strategic policies. Firstly, it was recognized in a number of sectoral policies (related to economy, environment, infrastructure, etc.); however, at the beginning of the 1990s, spatial development – ways to achieve it and its effects – appeared as a flagship theme important for further elaboration in order to better address the challenges related to all other sectoral domains. Current documents elucidating the field of spatial development deal mainly with the aspect of transnationality. More precisely, transnationality

appears for two reasons: 1) globalization – due to global capitalism, national borders are becoming looser thus enabling dynamic spatial relations, i.e. less control over nation state territories, promotion of a multi-level governance system and reorganization of territorial governance, and 2) network society – interconnected infrastructure networks are the incentive for an increase of interaction among people in larger spaces across borders (Dühr/Colomb/Nadin 2010: 16).

The aspect of transnationality is elaborated in key recent documents on European spatial development. The *Territorial Agenda of the European Union 2007* (EU Ministers 2007) highlights a clear demand for the strengthening and extension of trans-European networks, by addressing the issues of: 1) mobility and accessibility as key prerequisites for economic development in all European Union (EU) regions, 2) unhampered and socially fair access to information and communication technologies in all regions in order to remove territorially induced barriers to accessibility, especially in peripheral and rural areas, and 3) further exploration and development opportunities for the decentralized, efficient, safe and environmentally friendly production of renewable energy. The *Green Paper on Territorial Cohesion* (CEC 2008) provides comprehensive guidelines for European spatial and territorial development.[1] They can be summarized as follows: 1) promotion of a functional approach to the integrated development of territories, 2) fostering place-based policies through cross-sectoral coordination of policies and multi-level governance from the local to European level, 3) encouragement of cooperation between territories to strengthen European integration, and 4) improvement of knowledge of territories, to guide their development. The *Territorial Agenda of the European Union 2020* (EU Ministers 2011) promotes territorial integration in cross-border and transnational functional regions, because it: 1) can create a critical mass for development, diminishing economic, social and ecological fragmentation, building mutual trust and social capital, and 2) should be better embedded within national, regional and local development strategies.

Keeping the above in mind, transnational corridor development seems to be a useful instrument for addressing a number of aspects related to large-scale sustainable development policy. As the project "Spatial and Transport Development in European Corridors: Example Corridor 22, Hamburg–Athens" revolves around two aspects – space and infrastructure – it is directed towards identifying: 1) instruments for improving the use of the railway transport mode (including both passenger and freight transport), 2) the mechanism for exploiting urban development potential, and 3) advanced methods for the institutionalization of the aforementioned instruments, as a way to secure their efficient implementation. These specific mechanisms are the key topic of this publication. This article, however, aims to provide a basic overview of various factors affecting different spatial levels of the Orient/East-Med (OEM) Corridor.

1 The basic difference between spatial and territorial development concerns, respectively: on the one hand, the development of certain spatial units in order to achieve balanced development of the whole area these units form, and, on the other hand, the further development of the areas with a high development capacity, i.e. not necessarily the least developed areas.

The article is structured as follows. After introductory remarks, the main features of the corridor development in general (modes, scopes, dimensions, scales) are described. The central part provides a multi-level analysis of the OEM Corridor: 1) European/transnational level, elucidating different parameters relevant for the part of Europe affected by the corridor development, 2) regional level, focusing mainly on infrastructural issues in the cross-border areas, as well as among the regions within the nation states, and 3) local level, describing the places along the corridor with considerable spatial implications for transport development. Such an overview forms a basis for both defining the problems and creating the possible instruments for facing such problems, as provided in the following chapters of this book.

2 Integrated corridor development

Before proceeding with the main analysis of integrated corridor development, it is important to explain the meaning of corridor as a term. A corridor is a bundle of infrastructure and adjacent settlements and landscapes that link regions spread over a certain physical space (Witte 2014). Such a definition highlights two main corridor elements: infrastructure and its catchment area. Moreover, it is presumed that any transformation of a certain infrastructural axis – be this the upgrade of current infrastructure, the elimination of an old one or a new construction – directly affects the surrounding space; the effect is not the same on the landscape or on the inhabited area. In urban areas, different consequences of infrastructural development can be felt: better connections encourage the land prices in certain areas to grow; similarly, the economic prosperity of the region can be boosted; on the other hand, some urban areas become congested, with decreasing quality of life and deteriorating environmental conditions; finally, the infrastructure-based economic prosperity of one region can cause the economic decline of other regions, thus leading to center-periphery divergence. Briefly put, spatial and infrastructural development are 'two sides of the same coin' (Scholl 2012, 2016a).

Keeping this complexity in mind, there are a number of perspectives from which the corridor development can be observed. However, the following classification can simplify the process. Namely, there are four main indicators relevant for exploring corridor development: mode, scope, dimension, and scale. According to Priemus and Zonnenveld (2003), in terms of mode, the corridor can be road, rail or inland waterway, while in terms of scope, it is possible to differentiate between freight and passenger corridors. Nevertheless, two other factors are crucial for determining the approach used when dealing with corridor development. Chapman, Pratt, Larkham and Dickins (2003) firstly define various dimensions appropriate for corridor development analysis, such as: 1) infrastructure (physical and organizational infrastructure), 2) space (functions and morphology), 3) governance (politics and institutions), and 4) economy (finance and market conditions). Although there can be difficulties in combining various aspects to gain the synergetic effects of the corridor development, the improvement of its spatial and infrastructural dimensions certainly has no negative impact on the other two factors (Dühr/Colomb/Nadin 2010). Finally, the corridor devel-

opment can be observed from various scales, whereby the following three scales are of particular relevance: 1) transnational – due to its axial nature, the issue of corridor development usually goes beyond the national borders, 2) regional – comprising cross-border regions and the regions within one nation state, and 3) local – considering the spatial effects of infrastructural development at the urban node, e. g. city, town, or urban area (Chapman/Pratt/Larkham et al. 2003).

Effective corridor development demands collaboration between different stakeholders, i. e. the integration of various perspectives on how a corridor should be developed is essential for its long-term exploitation. In this context, four main stakeholder groups are identified as being of primary importance: 1) the interdisciplinary group of policy-makers, as corridor development is still considered as sectoral, i. e. involving a one-dimensional approach, thus engaging policy-makers from individual domains (e. g. transport, environment) who are unaware of the need for synergetic effects when combining various thematic fields, 2) administrative authorities, as the procedures between various institutions and governance structures are communicated mainly in a top-down manner, 3) technical experts, such as different operators, signal and infrastructure maintenance companies, and 4) academics, as there is an absence of specific knowledge with constant fragmentation of the academic debate.

Briefly put, in order to overcome various bottlenecks, corridor development needs a holistic approach. Horizontal cooperation among various sectors, vertical cooperation between various levels in a bottom-up manner, and exploring the possibility of implementing scientific findings within the technical boundaries of real life are key for effective implementation of corridor development policies.

3 Orient/East-Med Corridor: a multi-level analysis

The OEM Corridor is one of the nine EU TEN-T (Trans-European Transport Network) Core Network Corridors (EC 2011) and is a crucially important north-south transport corridor in Europe. Over its length of more than 2,500 km, it has the capacity to directly connect various ports in Europe: from the ports in northern Germany (e. g. Hamburg and Rostock), across the Danube ports (e.g. Vienna), to the Mediterranean seaports (e. g. Thessaloniki and Athens). Nevertheless, as it directly intersects the Danube river, the ports of the Black Sea are also easily approachable via the OEM Corridor. In addition, via branching off railway lines, the corridor is also connected to the Adriatic ports (e.g. Koper and Rijeka). With this broad area in mind, the project "Spatial and Transport Development in European Corridors: Example Corridor 22, Hamburg–Athens" takes into consideration two branches of the OEM Corridor: one route is the official EU axis from Hamburg to Athens running through the EU states of Romania and Bulgaria; the other is the Western Balkan route running through Serbia and the Former Yugoslav Republic of Macedonia, now Republic of North Macedonia (Fig. 1).

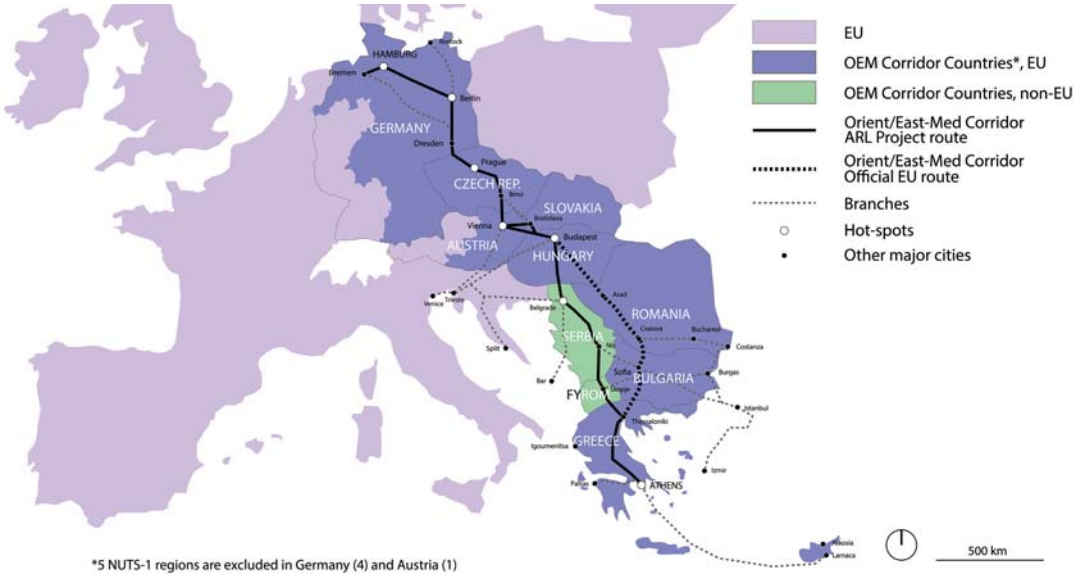

Fig. 1: Project perimeter – OEM Corridor with its two branches / Source: Mathias Niedermaier, ETH/IRL, Chair of Spatial Development

The OEM Corridor is currently an example of genuine shortcomings in various domains:

1 It runs through states with traditionally low economic performances in comparison with the developed western European countries.

2 There is also a significant lack of an efficient infrastructural network, seen in numerous missing links and bottlenecks.

3 In the recent past, the corridor coincided with the so-called migrants' route.

4 Administrative obstacles caused by mistrust among stakeholders as well as among various authorities of the nation states are common practice in cross-border issues.

The abovementioned challenges can hardly be solved from within. More precisely, as the development of the large-scale projects is affected by global factors (e.g. trade, economy, demography), it is important to stress the relevance of the OEM Corridor from the transcontinental perspective. Firstly, 43 % of global TEU (Twenty-Foot Equivalent Unit) traffic appears between Europe and Asia, reaching the most important European ports of Rotterdam, in the north, and Piraeus, in the south (UNCTAD 2017). Secondly, the New Silk Road is constantly upgrading through Chinese investments in the modernization of existing lines, as well as the construction of new high-

speed railway lines in both Asia and Europe. Finally, until 2050, the population rate in Europe will shrink to only 5.7% in comparison to the 10.1% of the global population who live in Europe today (UN 2017). In addition, due to low fertility rates, on the one hand, and societal problems (e.g. brain-drain), on the other, there is a constant loss of people from eastern Europe (Perić/Scholl 2017b). Hence, demographic decline together with boosting trade and economic factors actually trigger innovative ways of overcoming current challenges and, thus, striving for a sustainable future along the OEM Corridor. Therefore, as the OEM Corridor is considered an axis with huge potential for spatial development, strengthening its transport features could finally lead to territorial cohesion in Europe. The following section elucidates the current status of the corridor observed from three spatial levels: transnational, regional, and local, as according to the classification previously mentioned.

3.1 The Orient/East-Med Corridor: the transnational perspective

In general, improving the conditions along the OEM Corridor can be seen as contributing to better territorial cohesion along this axis and reducing gaps between western and eastern Europe (Perić/Scholl 2017a). The overview of the current state along the OEM Corridor has been drawn up using indicators of infrastructure, economy and demography, as the most relevant indicators from a transnational perspective, i. e. when comparing the OEM Corridor countries to the EU (Acebillo 2015).

3.1.1 Infrastructure

In terms of accessibility by different transport modes, the OEM Corridor is well behind other similar corridors (defined by the parameter of its length of approx. 2,500 km and with Hamburg as a starting point), particularly when it comes to the rail network. For example, in comparison to the travel time (by railway) between Hamburg and Almeria (Spain) – 35 hours and Catania (Sicily) – 26 hours, the travel time from Hamburg to Athens is twice as much – 60 hours, transfer time included (SBB online timetable 2018). The reason for this is a clear imbalance in infrastructure development that reflects the past of eastern Europe. High-speed train lines are in operation in developed countries such as Germany, Austria, Italy, and Spain, but they are completely missing in the Balkan countries. Moreover, the density of the high-level road systems is also lower in Romania and Bulgaria compared to the northern states.

The OEM Corridor has 51% lower performance than the EU countries when weighting following indicators together: imports/exports of goods, goods transported on rail/road, passenger transported on rail/road and rail/road network density (Fig. 2). Particularly inconvenient conditions are observed along the southern branch of the OEM Corridor (i. e. south of Vienna), which makes for great inconsistency in the railway schedules, and practically disables any efficient passenger and/or freight transfer along the corridor (Perić/Scholl 2017b).

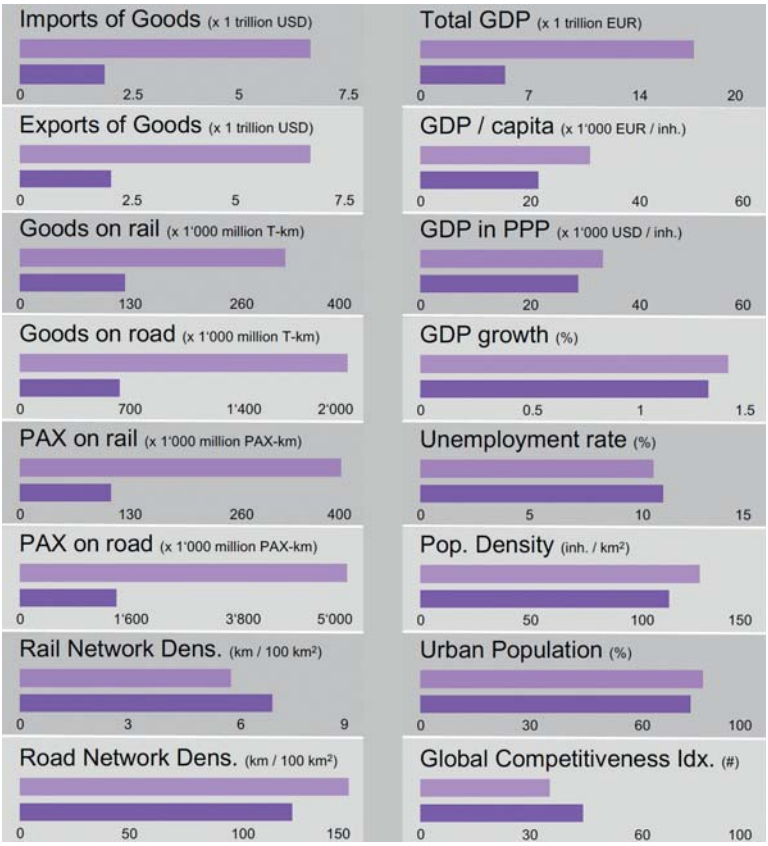

Fig. 2 (left): Transport-related indicators along the OEM Corridor (dark purple) and in the EU (purple) and Fig. 3 (right): Economy-related indicators along the OEM Corridor (dark purple) and in the EU (purple) / Source: authors, data 2014–2017 (Knoema n.d.; WTO n.d.)

3.1.2 Economy

From an economic point of view, the OEM Corridor and its catchment area is consolidating its economic recovery after the financial crisis. Between the corridor Member States, however, considerable differences in economic strength could be observed in the last 5 years: Germany, Austria, Hungary and Bulgaria maintained their GDP figures in the positive area, while the other seven countries experienced at least 1 year with a negative development of GDP, with a maximum annual decline of up to -8% in Greece and Cyprus (WBG 2017).

Nevertheless, in 2017, the corridor Member States experienced 3.10% GDP growth and are expected to experience stable growth at 2.7% until 2020 (IMF 2017). These figures are lower than overall global GDP growth (3.6%), but certainly better than the rest of Europe. In fact, the OEM Corridor just surpassed the European average and is expected to maintain this trend in the next 5 years.

The following economic indicators were compared between the OEM Corridor countries and the EU as a whole: total GDP, GDP/capita, purchasing power parity (PPP), GDP growth rate, unemployment rate, population density, urban population share and global competitiveness index. The analysis shows that OEM Corridor countries on average perform 21% lower than the other EU states (Fig. 3). Although the EU provided great support (also in financial terms) to the less developed European regions, the problems and limitations that the socialist countries faced during the period of the Cold War are still felt nowadays (Perić/Scholl 2017b).

3.1.3 Demography

Approx. 130 million inhabitants live in the regions along the OEM Corridor[2] (Scholl 2016b). Demographic figures in the region show a declining trend both in absolute terms and in labor force categories. Whereas the global population will grow in absolute terms, the European population will shrink by 7% and the population of the OEM Corridor by 15%. What is more worrying, the labor force in the corridor countries is projected to decline more strongly than in Europe in the coming decades. Although the labor force is shrinking at three levels (world, Europe, OEM Corridor), this process is most distinct along the OEM Corridor: 92 million people are now aged between 25 and 64, there will be only 63 million in this age category in 2060 (Acebillo 2015).

While old population segments will keep growing at a fast pace (+76% by 2060), the young age category will barely maintain its share in total population (-10% by 2060). Two indicators counterbalance the negative demographic prospects for the corridor: 1) a high life expectancy set at 77 years (world average is 70.4), and 2) a slight upturn in total fertility rate from the current 1.4 children/woman to 1.7 in 2060. Hence, these figures call for the OEM Corridor and European authorities to urge policies supporting natality. Moreover, immigration should be seen as an opportunity to counterbalance the shrinking European labor force and thus ease public expenditure pressure on retirement pensions (Acebillo 2015).

3.2 Regional differences along the Orient/East-Med Corridor

In Chapter 3.1 the east-west imbalance in European infrastructure development was introduced. This section offers an advanced exploration of regional differences along the OEM Corridor regarding the road and rail infrastructure under consideration of ongoing modernization projects. Beforehand a brief overview of important transport indicators is given.

2 The estimation is based on the NUTS-1 regions only, i.e. without including the population of entire states. More precisely, four NUTS-1 statistical regions in Germany (North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Baden-Württemberg), as well as Tyrol in Austria are excluded from the overview.

3.2.1 Transport indicators

The transport indicators vary considerably between the corridor countries. Following Acebillo (2015), the Modal Split and the transport volume between road and rail along the Corridor are assessed. Additionally, the freight volumes of the corridor ports are analyzed.

Modal split
The Modal split between road and rail transport generally shows a clear imbalance in favor of road transport (Fig. 4). The rail modal share is the highest in Serbia (46.7%) and Austria (33.0%), while a particularly low rate (in both freight and passenger transport) is observed in the case of Greece. For passenger transport, the highest rail modal shares are observed in Romania (13.8%) and Bulgaria (13.6%).

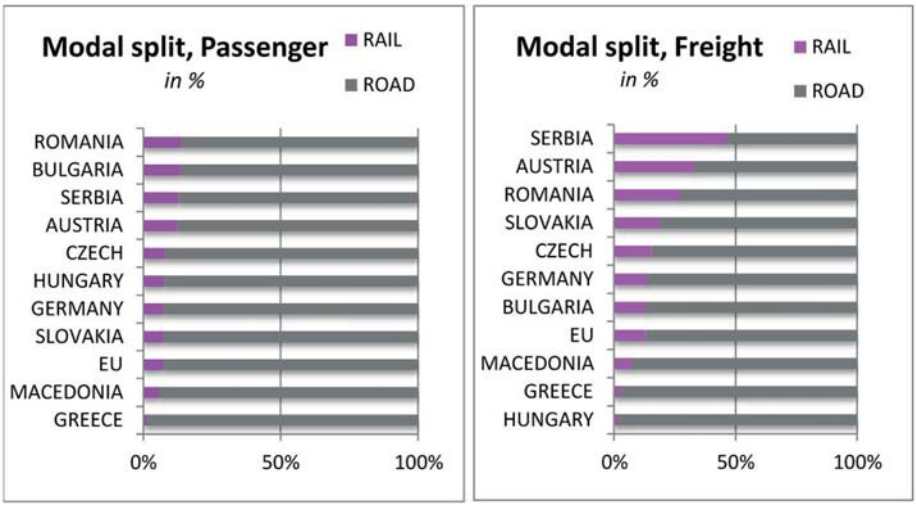

Fig. 4: Modal split between road and rail transport in the countries along the OEM Corridor / Source: authors (Knoema n.d.)

Freight transport volume
The highest freight transport volume in total on both road and rail exists in Germany, followed by Austria for rail and the Czech Republic for road transport. The lowest transport volumes occur in North Macedonia, Serbia and Greece (Fig. 5).

Passenger transport volume
In absolute numbers, the highest passenger transport volume by rail can be observed in Germany and Austria. For road, the highest transport volume is generated by Germany, followed by Greece. In both cases, Serbia and North Macedonia have the lowest passenger transport volumes (Fig. 6).

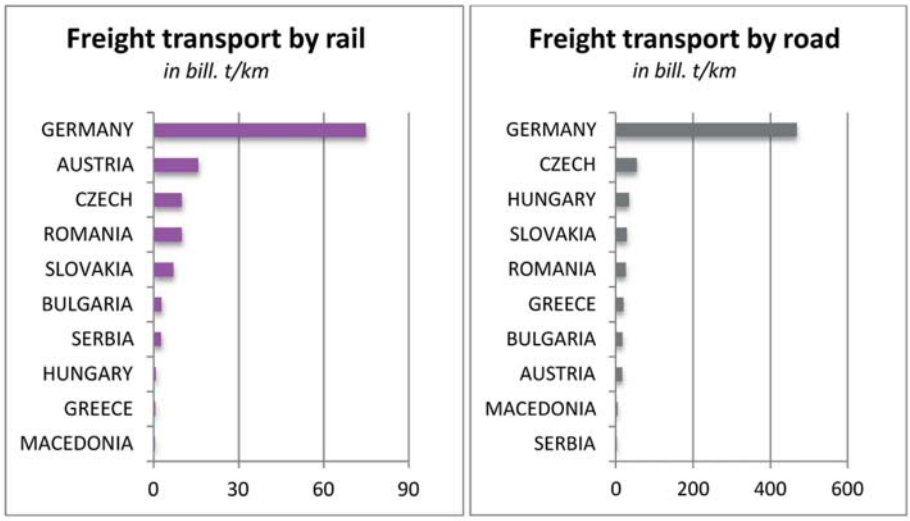

Fig. 5: Freight transport volume in the countries along the OEM Corridor / Source: authors (Knoema n. d.)

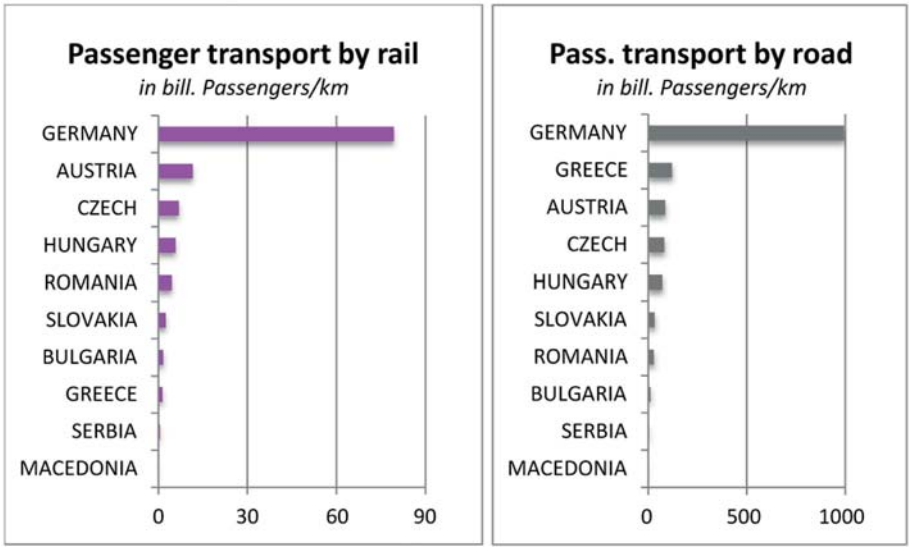

Fig. 6: Passenger transport volume in the countries along the OEM Corridor / Source: authors (Knoema n. d.)

Port throughput

An asymmetry can be clearly observed in freight distribution through the maritime transport mode. Sea freight is mainly concentrated in the northern ports of Hamburg and Bremerhaven, while maritime passenger figures are low in Germany. In contrast to this, in both the Greek and the Adriatic ports the main flows using the ports are the passengers, denoting a much more tourist-oriented economy than in the north (Fig. 7).

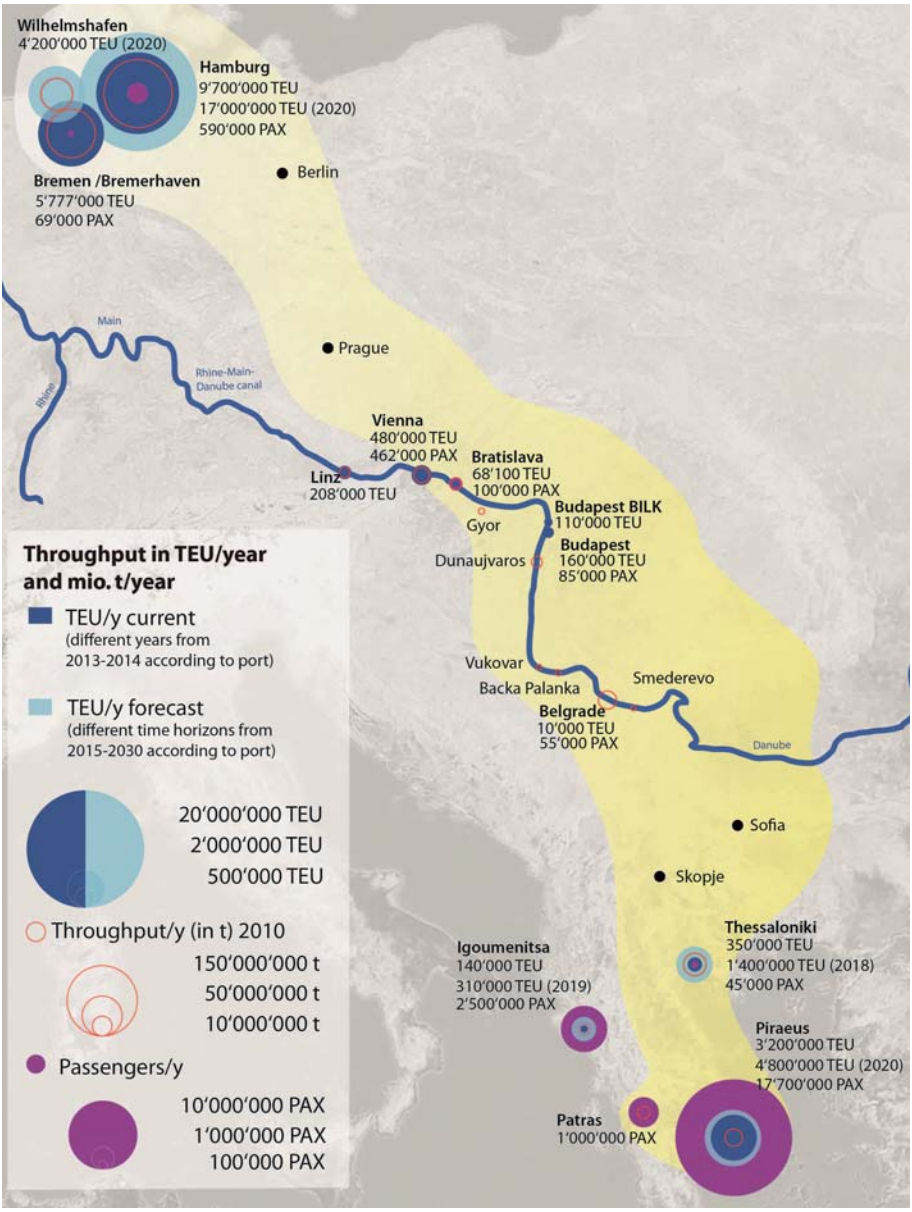

Fig. 7: Annual port throughputs along the OEM Corridor / Source: Mathias Niedermaier, ETH/IRL, Chair of Spatial Development

3.2.2 Rail and road infrastructure

On behalf of the European Commission, detailed analyses of the technical parameters of road and rail infrastructure were conducted in the 1st and 2nd phase studies of the OEM Corridor different sources, to be separated: (EC 2014 2017). Key findings show that the overall compliance of rail infrastructure to the TEN-T technical parameters is behind the compliance of road infrastructure.

Rail

In terms of the TEN-T technical parameters, six parameters are seen as critical for efficient long-distance rail transport: track gauge (1.435 mm), electrification (full electrification), maximum line speed (i.e. ≥100 km/h) and maximum axle load (≥22.5 t), maximum train length (i.e. ≥740 m) and full deployment by ETCS + GSM-R (Regulation (EU) 1315/2013). The current assessment for the OEM Corridor is as follows. The quality of rail infrastructure is better in the regions north of Budapest. Besides several sections with limited maximum train length, the TEN-T technical parameters for track infrastructure are met throughout: track gauge electrification, maximum line speed and maximum axle load (Regulation (EU) 1315/2013). In contrast to this, between Budapest and Athens on the two sections Craiova(RO)–Golenti(RO) and Kulata(BG)–Strimonas(GR), track gauge is the only one of the TEN-T technical parameters met, while further sections underperform at more than one parameter (EC 2014). Regarding the train operation and communication technology, the corridor is fully equipped with GSM-R in Germany, the Czech Republic and Austria. Full employment of the train operation and management system (ETCS – European Train Control System) has not yet been reached in any state, thus hindering smooth international transport (EC 2014). In detail, the overall percentage of compliant sections along the OEM Corridor in 2014 was: track gauge 100%; electrification 89%; maximum line speed 85%; maximum axle load 71%; maximum train length 54%; full deployment of ETCS 10–14%; full deployment of GSM-R 49%. At the same time the situation in the Western Balkans Six (WB6) is even more challenging: track gauge 100%; electrification 83%; maximum line speed 44%; maximum axle load 79%; maximum train length 13%; full deployment of ETCS 0%; full deployment of GSM-R: not identified (EC 2017).

Road

In terms of the TEN-T technical parameters on road infrastructure, the main parameter to be compliant by 2030 is the availability of express roads/motorways along the entire length of the corridor. In 2014, 82% of the road sections along the OEM Corridor were classified as motorways or express roads, with only Germany reaching a compliance of 100%. The 18% non-compliant sections correspond to ordinary roads. Besides short gaps spread over the entire corridor, non-compliant sections of over 50 km are existent in Romania, Bulgaria and Greece. Upgrading is advancing fast, in 2014, of the missing 18% (999 km in total), 8% (460 km) were under construction, resulting in almost 100% compliance on express roads/motorways being expected by 2030 (EC 2014). At the same time in the Western Balkans Six (WB6) 63% of the road sections were classified as motorways or express roads, with expected compliance between 85% and 100% in 2030 (EC 2017).

3.2.3 Rail and road infrastructure projects

This chapter gives a brief overview of ongoing projects in the rail and road infrastructure.

Rail
Based on our previous analysis, rail infrastructure projects of 17.4–19.5 billion euros worth are ongoing and projected along the OEM Corridor (Fig. 8). While the existing network meets the required technical parameters northwest of Budapest, projects are implemented here to increase capacity or line speed. Critical bottlenecks regarding capacity exist additionally in the urban nodes of Hamburg, Berlin, Prague and Budapest, making investments necessary. Southeast of Budapest, the situation is complex, modernized sections are mainly limited to Hungary and Greece. With the upgrade of the Budapest–Belgrade main rail line an important rail project is under construction in Hungary/Serbia. Considering the long planning and construction periods of rail projects, it is likely that several sections in Romania, Bulgaria and North Macedonia will remain inadequate beyond 2030, since these sections lack any scheduled projects. To mention hereby is that the neighboring countries of the Near East are gradually establishing stable railway connections, e.g. Turkey, Georgia and Azerbaijan (Niedermaier/Perić 2018). In addition to the ongoing projects, it was estimated that the sum necessary to meet the TEN-T parameters along the remaining non-modernized sections on the OEM Corridor totals between 9.5 and 14.3 billion euros for the OEM route and 3.5–5.2 billion euros in total for the route via Serbia and North Macedonia (authors' estimation).

Road
Based on our previous analysis, road infrastructure projects worth 6.0–6.7 billion euros are ongoing and projected along the OEM Corridor (Fig. 9). The availability of express roads/motorways is good throughout the corridor, with the gaps in Bulgaria and the Western Balkans being progressively filled. Upgrade projects to increase the capacity are ongoing in Austria and Germany. The upgrade of only a few sections, e.g. in Romania, is not yet planned, limiting the amount of pending investments. The main challenge for future road infrastructure will be to offer sufficient capacities in the urban nodes, provoking countless costly lane extensions in future.

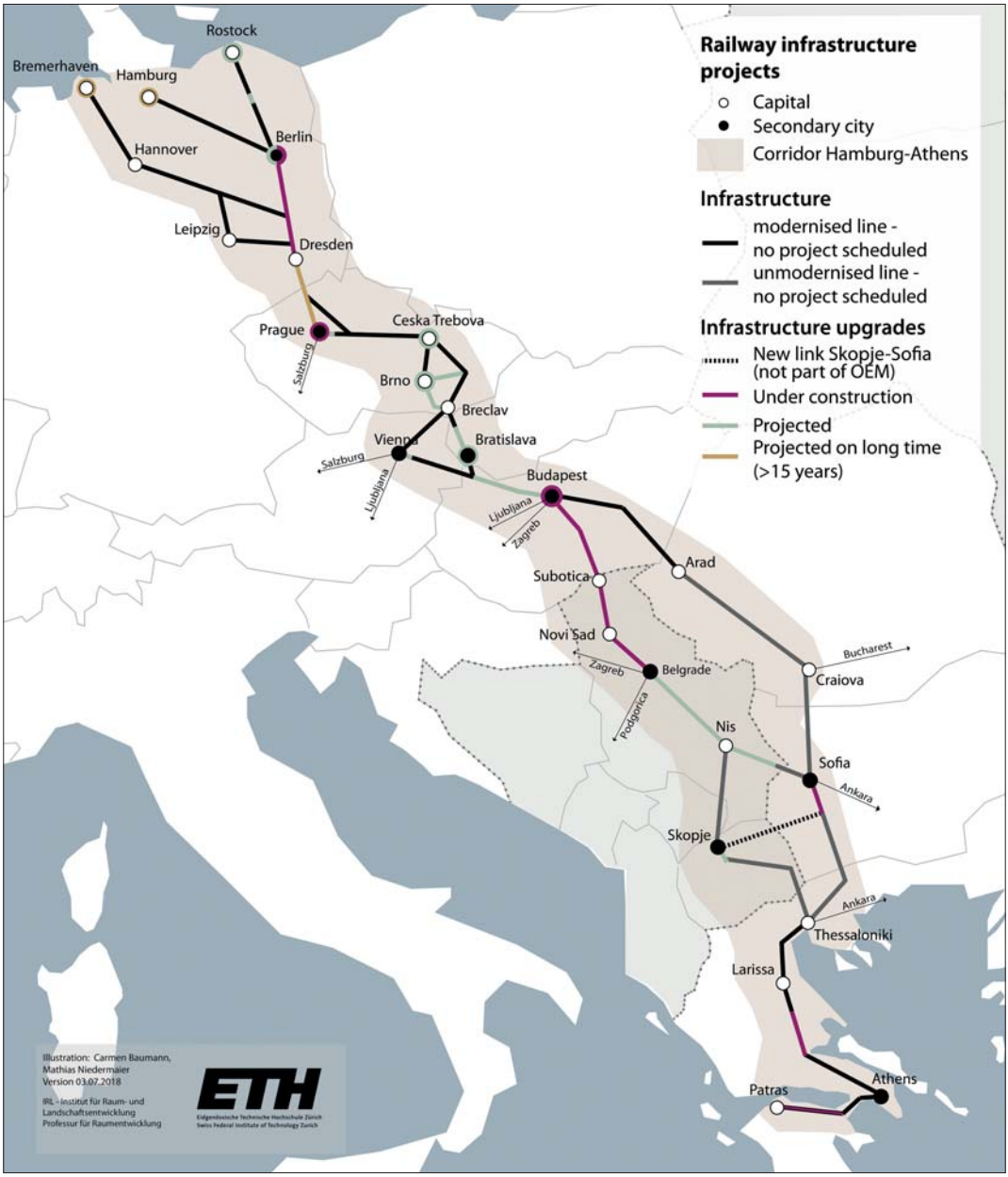

Fig. 8: Overview of the rail infrastructure upgrades along the OEM Corridor / Source: Carmen Baumann, Mathias Niedermaier, ETH/IRL, Chair of Spatial Development

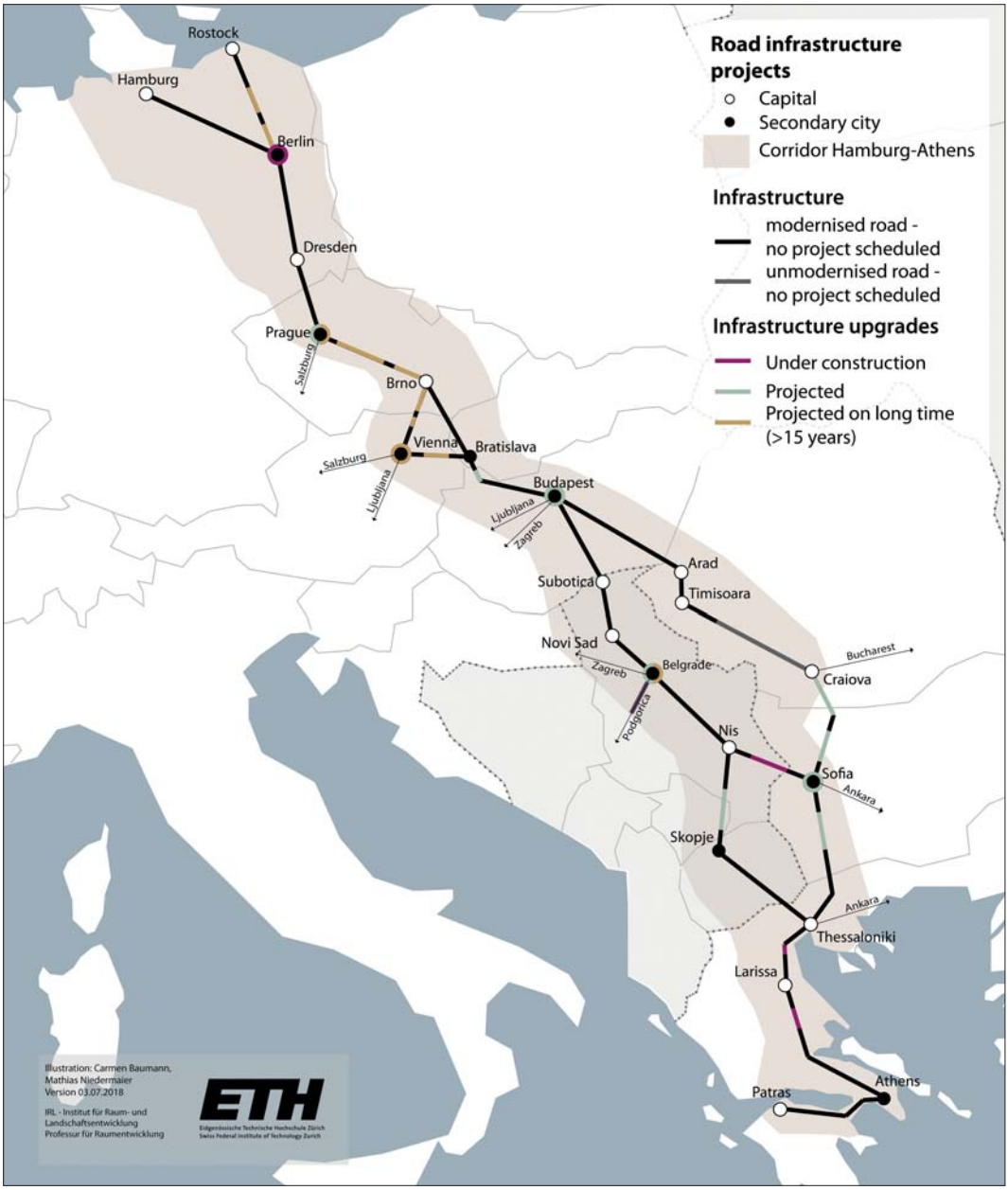

Fig. 9: Overview of the road infrastructure upgrades along the OEM Corridor / Source: Carmen Baumann, Mathias Niedermaier, ETH/IRL, Chair of Spatial Development

3.3 Hot spots along the Orient/East-Med Corridor

The local scale of the OEM Corridor project relates to identifying the hot spots – places with major spatial implications for transport infrastructure development. Moreover, it is interesting to observe some 'good-practice' examples of integrated spatial and infrastructure development as well as more challenging case studies. The result is directed towards mutual learning finally aimed at improving collaboration among various stakeholders with different interests.

3.3.1 Hamburg

With its good accessibility by sea and land, Hamburg today is an important point of exchange with other European cities. More precisely, Hamburg connects the south and north of Europe, as a node along the Scandinavian–Mediterranean Corridor. In addition, it is one of the main nodes in northern Europe today, as it lies on the North Sea–Baltic Corridor. Nevertheless, as Hamburg is the start/end point along the OEM Corridor, its greatest potential relates to the future development of the operational capacities of Hamburg port according to general improvements of the railway routes along the entire OEM Corridor.

Hamburg has a trade history dating back to its early past. In the 19th and early 20th centuries, a new step in the development of the port took place, when a free port was developed on a 157-ha area southeast of Hamburg's historic city center. With the containerization of global shipping transport, from the mid-20th century on, new container ports and terminals developed west and southwest of the city center, making the free port area increasingly redundant (Makait 2018). In 1997, the construction of a new city district was discussed widely and a political decision made in its favor. The ambitious project for the 157-ha area redevelopment is still in progress, although the major part has already been completed. Despite the fact that 10 more years are expected until completion, the so-called HafenCity is already a famous example of turning devastated port infrastructure into high-quality urban areas (Fig. 10).

HafenCity is a valuable example of fulfilling both green and high sustainability standards. More precisely, in addition to new mixed-use neighborhoods (with 6,000 homes and 45,000 jobs), Lohsepark (i.e. the Central Park of the HafenCity) will be extended to the River Elbe. As a result, the area allocated to public spaces will increase to 26 ha, while the public waterfront extends to 10.5 km (HafenCity Hamburg 2016).

Western HafenCity has developed rapidly since approval of the master plan in 2000. The east is still an area in the planning phase, for which the master plan has now been developed further. The three eastern neighborhoods are more extensive but less integrated into the existing city than the western and central HafenCity. Their proximity to transport routes also calls for noise protection planning. But this also creates special opportunities to give the eastern neighborhoods an identity of their own. Their urban

development structure is closely related to conditions for their utilization. Each neighborhood will have its own focus: Baakenhafen as a place for living and for leisure, Oberhafen for creative and cultural uses, and Elbbrücken as a metropolitan location for business and housing (HafenCity Hamburg 2016).

Fig. 10: HafenCity of Hamburg with the new opera / Source: Maxim Schultz

Additional land area will be gained, for example, by partially filling in Baakenhafen harbor basin, which will lead to more green landscape and allow a second line of residential buildings in a location protected from noise. In place of the original target of around 1.5 million m^2 of gross floor area (GFA) in the whole of HafenCity, increased area and density now mean that 2.32 million m^2 GFA can be realized. The overall land area has increased from 123 to 128 hectares.

Reworking of the master plan also means that the number of homes that can be built is much higher. In the eastern HafenCity housing can be built in places previously not considered very suitable. A total of 2,800 housing units will be created in Baakenhafen and Elbbrücken, raising the total number of homes in HafenCity from 5,500 to 6,000, with the calculation of average unit size increased to 110 m^2 GFA. Community building associations will receive more consideration in site tenders and larger quantities of subsidized public rented housing will also be built. Additional primary and secondary schools as well as child daycare facilities will also enhance HafenCity's attractions as a place for families to live. The number of potential jobs also rises markedly from 40,000 to well over 45,000. The new jobs will be primarily in leisure, retail, catering and hotels, so a boost of the tertiary sector is expected in the area (HafenCity Hamburg 2016).

The high standards of sustainability set in the western neighborhoods will actually be outdone by the east. This progress is due to the innovative heat supply concept as well as the planned high proportion of new buildings qualifying for the gold HafenCity Ecolabel. The extension of the U4 subway line to Elbbrücken station makes another important contribution to environmental quality. The reworking of the master plan further reinforces HafenCity's function as a city. For the first time the plan's provisions for the urban development scheme now embrace the entire area through to its easternmost point, laying down the highest standards (HafenCity Hamburg 2016).

3.3.2 Berlin

Similarly to Hamburg, Berlin is also a key node in connecting regions of northern Europe. Nevertheless, the history and territorial position of Berlin always posed the challenge of creating feasible connections to both south Germany and the eastern neighboring countries of Poland and the Czech Republic.

In terms of spatial development, the fall of the Berlin Wall in 1989 literally relocated brownfields from the inner German border to the heart of the German capital. In the 1990s, on the southern part of these brownfields, the new German government district was constructed in close proximity to the historic Reichstag building. Almost simultaneously, in 1992, a new operational concept for the Berlin railway network was incorporated into the German Federal Transport Investment Plan: the commonly called mushroom concept, which comprises a new north-south main-line railway tunnel, the reconstruction of the Dresden main-line railway and the new Berlin Central Railway Station, Berlin Hbf.

The central station's position was projected at the intersection of the existing east-west Stadtbahn main-line railway and the new north-south tunnel, close to the former inner German border. While the reconstruction of the Dresden railway line is ongoing until 2025, the north-south tunnel as well as the new Berlin central railway station opened in 2006 – at this time still adjoined by brownfields on its northern side. With the commissioning of the Berlin Central Station in the year 2006, an extremely efficient railway junction was created, where approx. 1,125 trains arrive daily, and which is frequented by over 300,000 travelers and visitors every day. The station has approx. 15,000 m^2 of retail space for 80 stores. Three-quarters of the approx. 50,000 m^2 of office space are used by the *Deutsche Bahn* itself. During the planning phase, noise emissions from road and rail traffic played a special role. Namely, extensive sound insulation measures were taken to counter these negative effects (Kenzler 2016).

Since 2008, the project called Europacity (Fig. 11) has been prepared for the northeastern vicinity of the Berlin Central Railway Station, once used as a freight port. The specificity of the project for the new central station is its relying on the idea of tradition – it was constructed on the traditional site for the future of the city. The Europacity project is designed as a mixed-use quarter intended to improve urban life – a 40-ha area for office, residential, shopping and leisure, and cultural use, not forgetting the importance of green areas for the quality of life in urban environments.

Fig. 11: The Berlin Central Railway Station and Europacity in its vicinity / Source: www.tagesspiegel.de, Visualisierung: PROMO

After nearly 10 years of conception and planning of the Europacity project, the realization of the first high-rises and various development measures started in 2013. A mixture of residential properties, offices, restaurants, commerce and culture is coming into existence on a gross floor area of over 600,000 m^2. In other words, residences for over 4,000 people and approx. 10,000 jobs will be created. The offered space will be absorbed by the market in about 8 to 10 years (Kenzler 2016). The site is shaped by its proximity to the new Central Station, the central junction for intercity and local traffic, and to the government district, with the Bundestag, the Federal Chancellor's seat and ministries at the interface between the former East and West Berlin (Kenzler 2016). The development around the Central Station of Berlin is directly connected to the reunification of Germany and relocation of the parliament and the federal ministries to Berlin. The demolition of the historic city railway station Lehrter Bahnhof for the new Central Station could only be justified by a general differentiated concept of train traffic, which was made necessary by the new situation of Berlin (Schoen 2016).

The building of the new Central Station and tunnels for train-, car-, and subway traffic right next to the parliamentary buildings in the Spreebogen was a big logistic and technical challenge. The side surface and underground constructions demanded a high degree of coordination and professional regulation. Demanding technical constructions under the earth enabled a good design for the parliamentary quarter above. The buildings were constructed in an ambitious planning horizon between 1995 and 2000 (for the parliamentary buildings) and up to 2006 (for the Central Station) with a budget of overall three billion euros. After the first upswing in the beginning of the 1990s, the development around the Central Station came to a complete standstill at the beginning of the new millennium. The development made progress just after 2010, i. e. after the global financial crises Berlin again became interesting as an investment site.

The building of the Lehrter Quarter south of the Central Station is in progress, the buildings around the Humboldthafen will be finished within the next few years, while to the north of the station development started in 2014 and will still take up to at least 8 years to be finalized (Schoen 2016).

Residential and office buildings with impressive architecture are being erected around the ornamental Humboldthafen basin, as well as a promenade with restaurants, cafés and boat docks. Even the adjacent canal, once dug for freight transport, will become a landscape gem in the course of the Europacity's development – a place for strolling visitors to the art museums, office workers and for the inhabitants of the new residential quarter along the bank, all the way to the Wasserstadt Mitte on the Nordhafen (Europacity-berlin 2018).

West of Heidestrasse, which as a central boulevard connects the Europacity and the Central Station with the Wedding district, the Quartier Heidestrasse is being erected in a typical Berlin mix, with subsidized and market-rate apartments, commercial spaces and a center for the supply of daily needs to the entire Europacity. Parallel to this, the business center of the Europacity is growing at the southern end of Heidestrasse with hotels and office buildings for renowned international enterprises in landmark architecture, such as: Tour Total, the 50Hertz corporate headquarters, the new Berlin headquarters of PricewaterhouseCoopers at Humboldthafen and the residential building KunstCampus (Europacity-berlin 2018).

3.3.3 Prague

Although also on the line of the Rhine-Danube Corridor, the improvements of the transport network in the Czech capital have to be considered in close relation to the neighboring German city of Dresden, lying along the OEM Corridor. In fact, the Czech priorities in terms of railway development particularly address the northern and central regions (Švehlik 2015). More precisely, the region of Usti nad Labem (border area with Germany) is recognized as the focus of transport development in the Czech Republic, while there is a European project to construct a new railway line instead of the current one that follows the flow of the River Elbe.

The current initiatives for infrastructural enhancements along various sections of the Dresden–Prague line should secure a significant increase in train speed: between Dresden (D) and Usti nad Labem (CZ) a speed of 200 km/h is expected, while from Usti nad Labem to Prague, speeds should even reach 350 km/h. Furthermore, the train speed along the section Prague–Brno (the central part of the Czech Republic) is foreseen to be 250 km/h, which will significantly increase connectivity throughout the entire country. In terms of time-saving, the current travelling time in the section Dresden–Prague is 135 min, and it should become only 50 min. In terms of distances, nowadays the distance between Dresden and Prague is 192 km, and it is foreseen to be 154 km (123 km of which are new railway infrastructure) (Ilik 2015). For more detailed information on the Dresden–Prague line, see Heldt in this book.

Passenger transport is a priority in the Czech Republic. Nevertheless, since the state is the intersecting area of many European freight corridors, freight transport should be understood as a tool for boosting the economic capacity of the entire country. Although the Dresden–Prague line is part of the OEM Corridor, connections to other European ports (in particular the Mediterranean ports) should be taken into account: e.g. Hamburg is 600 km away from Prague, while Koper (Slovenia) or Rijeka (Croatia) are only 150 km further away (Samek, 2015).

Moreover, there is a clear need to combine transport policies with spatial policies, although spatial development is considered a challenging task in the Czech Republic. On the one hand, there is the problem of how to treat railway infrastructure in protected landscapes, while on the other hand, it is a challenge to integrate railway infrastructure into the urban pattern.

One of the challenging examples is the city of Usti nad Labem, situated in a traditional industrial area, with numerous problems: around 15% of the city area is covered by brownfield sites; out of 90,000 inhabitants, 20% is the Roma population; the extent of the 'brain-drain' was very extensive in recent years; local government has no active role in coping with complex issues, etc. Under such circumstances, the region of Usti nad Labem is certainly not considered as competitive or metropolitan. However, one of the fastest sections along the entire OEM Corridor is to pass through the area, and this infrastructural improvement of the main network should be a clear sign for strengthening of the secondary and tertiary network. Only in this way can the Czech region of Usti nad Labem be considered a relevant counterpart for cross-border cooperation with the German state of Saxony.

While the improvement of urban settlements in the cross-border areas is mainly supported by EU funding, the situation in the Czech capital is significantly different. More precisely, the main financial resources for urban development projects stem from private investors. The city administration is not capable of dealing with such spatial demands, hence providing an interesting arena for developers. The most significant project in the domain of integrated spatial and transport development under consideration in recent years in Prague is the redevelopment of the former Bubny railyard, i.e. a current brownfield site. Although it is one of the largest stations in Prague by area (20 tracks and six platforms), today it serves a few local trains and has very limited passenger facilities (Ilik 2015).

Bubny railway station has a good strategic position – it is close to the airport (15 minutes by the planned flier train), and very close to the city center. Moreover, it is a five-minute walk from the Holešovice train station (the second largest station in Prague), and in close proximity to the metro- and tram-stations. Hence, it is not surprising that the 27-ha brownfield area attracted private developers (CPI ORCO – a French development group), who bought the site from the Czech Railways in 2006, intending to build a 'city within a city'. Since then, a number of studies and district master plans have been provided, illustrating the following mixed-use neighborhood: the office buildings should occupy at least half of the area (600,000 m^2), a third of the

current office space in entire Prague (Fig. 12). Another third of the area should serve for residential use and shops. The remaining space is to be offered either to a public or private university for a campus, and there is also a plot ready for building a hospital (Went 2012).

Fig. 12: Visualization of the future development of the Bubny railroad area / Source: Institute of Planning and Development, IPR Praha

Nevertheless, due to the financial crisis dating back to 2008, none of the plans have yet been realized. In order to show willing to make certain steps towards regenerating the area, in 2015 the developer demolished the historic buildings on the site. However, this turned out to be a complete failure, since the City of Prague then ceased any negotiations with the developer. Currently, there is a development moratorium in place. With significant financial losses now, the developer is not able to find a way to finance a project that respects the neighborhood morphology, character and infrastructure. New solutions primarily represented by the city administration are yet to come (Went 2012).

3.3.4 Vienna

Throughout history, Vienna has constantly stood at the border between different empires, ideologies and cultures. In medieval times, Vienna was the starting point of the Ottoman Empire, while during the Cold War, Vienna was the closest spot of Western capitalist society for all the states behind the Iron Curtain. Today, Vienna is again considered a city of great European importance for two main reasons: 1) there are several corridors that intersect in the capital of Austria, and 2) Vienna is an important city in one of the most significant macro-regions in Europe – the Danube region.

Vienna started to develop the image of an interesting node of European importance in the 1990s, when networks such TINA or pan-European corridors emerged (ECMT 1997). At that time, the Austrian capital was the intersection point of four pan-European corridors – IV, VI, VII and X. Later on, the main instruments of the European transport policy (i.e. TEN-T network in 2005, and Core Network Corridors in 2011) also put Vienna in the spotlight – today the city is the intersection point of three European corridors: the Baltic–Adriatic, Orient/East-Med and Rhine-Danube Corridors. Moreover, Vienna is placed along the Paris–Budapest line, considered the 'highway for Europe' (EC 2011). Finally, observed through the lens of global development, Vienna, as the central European capital, is an important node bearing in mind the development of the routes of the New Silk Road in Europe.

The other important issue regarding Vienna's role in strengthening the entire continent tackles the notion of macro-regions in Europe. Vienna is one of the largest economic nodes in the Danube region, which includes 14 states and 150 million inhabitants. The Danube region strategy covers four main pillars – economic development, social cohesion, environmental protection and institutional improvement (EC 2010). Due to its historical background, the Austrian capital is mostly focused on two issues: 1) capacity-building, thus actively engaging in the sharing of knowledge and best practices on how to effectively deal with administrative bottlenecks emerging in the majority of the Danube region countries, and 2) connectivity improvement, including various transport modes, mainly ports and railways.

The port of Vienna covers both freight and passenger traffic. In fact, the Viennese port consists of: 1) three cargo ports (Lobau, Albern and Freudenau), 2) Vienna Marine (leisure and sport harbor), and 3) two passenger shipping ports (TwinCity Liner to Bratislava and the port for cruise liners). The cargo ports have the largest container terminal on the Danube, due to the tri-modal transport connection as well as proximity to the airport. The ports occupy the total area of 3 million m^2 in the first district of Vienna, with the modal split as follows: 45% train, 35% truck and 20% ship transfer. Since there are more than 100 companies on the site with up to 5,000 jobs, the port of Vienna is one of the leading economic clusters of the entire region (Rojko 2016). In addition to this, the TwinCity Liner to Bratislava is considered a valuable mechanism for efficient cross-border exchange.

The railway improvements need to be understood in close connection to the spatial development at various scales (Schwab 2016). Firstly, Vienna is considered a city of regional importance, with particularly important connections to the Slovakian cities

of Bratislava and Košice. The number of everyday commuters in the region of Vienna is also significant in terms of developing strategies for future transport improvements – there are 200,000 commuters to Vienna and 80,000 out of Vienna on a daily basis. Hence, the main development potential of the Vienna metropolitan area is just in the proximity of the main transport nodes. More precisely, the catchment areas close to the Northwest Railway Station, North Railway Station and the Central Railway Station, as well as the Lake City Aspern (*Aspern Seestadt*) are the current zones possible for integrated spatial and transport development. The recent transport challenge in the Vienna agglomeration involves the extension of the metro lines (U2 and U5), that are foreseen to cost 2 billion euros, with a proposed deadline in 2025 and 2028, respectively. Finally, Vienna deals with the available construction areas in a smart way – there are great brownfield sites (military zones and shopping centers in the suburban areas), which are to be regenerated for new uses thus supporting the large population and enlarged infrastructural network.

One of the examples of integrated spatial and transport development in Vienna is the Central Railway Station (Hartig 2016). The new station was built as a through station in the area of two former terminal stations. It was partly opened at the end of 2012, officially opened 2 years later and has been in full operation since December 2015. The station is a great transport hub – with connections to the metro-, bus- and tram-lines. Located in the XI district of Vienna, the station covers 108 ha in total: 55 ha (railway station) + 53 ha (shunting yard, service). Nevertheless, the station is more than a transport junction. The entire complex (including the station itself and its surroundings) consists of: a shopping center – 20,000 m^2, office space – 550,000 m^2, residential area – 5,000 apartments, city park – 8 ha, school and kindergarten (Fig. 13).

Fig. 13: Catchment area of the Central Railway Station in Vienna / Source: Aldinger+Wolf (n. d.)

The main stakeholders in the process of constructing the station were: the Austrian Federal Railways, the City of Vienna, and the private developers, while an interdisciplinary network of experts (architecture, urban planning and railway transport) was a constant support. Such a complex project demanded an environment where compliance between the tasks, responsibilities and competences was consistent and, thus, sustainable, while active self-organization and context-oriented control were thoroughly practiced. The resulting holistic leadership style involved a dense network of knowledge and procedures, while the project management served to link the various requirements (Hartig 2016).

3.3.5 Budapest

As an intersection node between the Mediterranean, Rhine-Danube and OEM Corridors, Budapest is an important point in bridging the west and south-east of Europe. In addition, due to emerging demand for supply chain management and shared service centers, Budapest is one of the most attractive logistics sites in central and eastern Europe. However, the Hungarian transport policy, particularly its implementation in the Budapest metropolitan region, is not elaborated to a level that can satisfy current logistical demands. Namely, the discrepancy between transport and spatial policies is obvious.

Fig. 14: Projected office campus development to take place on the right bank of the Danube close to the Southern Connecting Railway Bridge / Source: Foster+Partners 2017

The urban development of the large brownfield areas nearby, Kelenföld, Déli and Nyugati railway stations, as well as in Ferencváros and Csepel Island (Fig. 14), could be boosted by a new international rail corridor, but only if priorities can be set up regarding the urban development of Budapest and the rail system. However, there is no consistent strategy oriented towards tackling such problems, and, moreover, the abovementioned areas are not taken into account within a strategy. In addition, the rail system is being developed without a long-term vision of how to treat the bottlenecks and outdated system elements in Budapest, as well as how to logically connect it with other Hungarian cities, avoiding over-centrality. More about the general social and economic context for spatial and transport development in the Budapest metropolitan area is given by Wolf/ Kádár in this book.

3.3.6 Belgrade

For centuries, Belgrade has been a node between West and East. The River Danube confirms this connotation of Belgrade even nowadays. However, Belgrade is currently also a crucial link between the north and south of Europe: according to EU transport policies, Belgrade is an important node on the OEM Corridor branch through the Western Balkans (EC 2017); according to global trends, Belgrade is a key point of the Belt and Road Initiative (BRI) in spreading Chinese influence from the port of Piraeus towards the heart of central Europe.

Fig. 15: Visualization of the future development of the Belgrade Waterfront project / Source: Belgrade Waterfront 2016

As the city of Belgrade still suffers from socio-spatial transition, many challenges are pending. Finding the appropriate spatial solutions is made difficult mainly due to the insufficient collaboration of all the interested parties – usually the decisions are made at the expense of public interest. One of the striking examples of tight cooperation between private investors (from the United Arab Emirates – UAE) and the national government is the agreement for the Belgrade Waterfront project (Fig. 15), signed in 2015. Phase A of this project (one residential building and part of the infrastructure in its surroundings) was finished in July 2018, while the foundations for the shopping mall and multifunctional tower are in progress, too. With this in mind, the Belgrade Waterfront seems to be fulfilling the promises given in 2015. However, the question of public interest and the price the national government had to pay (in terms of undertaking all the infrastructural work, as the most expensive part of any construction) still remains open. More about this project is presented by Čukić/Perić in this book.

3.3.7 Sofia

Sofia is a nodal point for the Bulgarian transport connections and a junction of four international transport corridors: connections to Greece and Romania are served by the core axis of the OEM Corridor, a comprehensive connection reaches to the Black Sea and Turkey, while Serbia is linked by Corridor X (Danailov 2017). However, Bulgaria and its capital are facing contradictory development trends. While the national population is shrinking by 0.8% annually and Sofia is growing at 0.8% annually, some rural regions are suffering a population decline of up to 5.4% annually. Such a challenging situation requires diverse responses to urban and infrastructural development. For the capital region, strong investments into the transport network have been implemented (Troeva 2017). The last sections of the capital's highway ring will shortly be upgraded to four lanes. The modernization of the main station was completed in 2016, while the rail network is undergoing continuous modernization (Rafailova 2017). Interchange stations are being constructed stepwise to offer additional links between rail and the growing metro network. These investments offer broad options for future inward-oriented development (Fig. 16).

The major development in Sofia is currently concentrated in the southeast and in the western outskirts, in each case well accessed by the ring road. Beyond that, huge industrial sites shut down in the past are situated in close proximity to Sofia. Since these sites are increasingly well accessed by road, urban development on these properties will be an attractive option for the mostly private owners in future. A major challenge for the future is how to limit the urban sprawl that may result from road-oriented development (Zdravkov 2017; Borisov 2017).

Fig. 16: The winning entry of the international competition for the "Secondary city centre – catchment area of the Sofia Central Railway Station" / Source: aaa 2018

3.3.8 Athens

Athens, as a start or end point of the entire OEM Corridor, is one of its most challenging hot-spots. On the one hand, this is illustrated by Piraeus, the port of Athens, which is the largest passenger port in Europe, with approx. 17 million passengers in 2017 (PPA 2018). Hence it is also famous as 'the Rotterdam of the south'. On the other hand, all passengers coming to Greece via sea routes are just stuck in Piraeus. More precisely, due to the poor and non-electrified railway network, travelling through Greece is pretty far from a comfortable journey. To exacerbate this, until May 2014, the railway service from Thessaloniki to the north was totally disrupted. Today, the situation has been gradually changed, however there are still plenty of obstacles and thus areas in need of immediate upgrade, be they in the domain of port and railway infrastructure improvements or spatial development.

The enhancement of the Piraeus freight port has been made possible in recent years due to investments made by the Chinese company COSCO (Chinese Ocean Shipping Group Company). Today, 67% of the port of Piraeus is owned by COSCO, while PPA (Piraeus Port Authority) is in charge of passenger and partly of freight transport. The current capacity of the port terminal is 5.5 million TEU/year, while cargo transfer is as follows: 70% transshipment cargo (ship to ship) – from the Far East to the Black Sea; 30% local cargo – 19% remains in Greece (mainly transported by lorries), while 11% proceed to the Balkan area (North Macedonia, Serbia and Bulgaria). Further investment considers enlargement of the network to include the Czech Republic (Zartaloudis 2016).

In terms of railway development, the position of Athens should be understood in light of the national priorities (Vourdas 2016). The backbone of the Greek railway network is the line from Athens to Thessaloniki. The second priority is the improvement of the cross-border sections: Thessaloniki–Eidomeni (90 km), the border with North Macedonia and Thessaloniki–Promachonas, and the border with Bulgaria. Although the cross-border section with Bulgaria has a greater impact in terms of further territorial cohesion in the European Union, due to the difficult topography here priority is currently given to the cross-border section in the vicinity of Eidomeni. The third priority is the section in northern Greece called the Egnatia Railway, leading from Igoumenitsa to Alexandroupolis, connecting four ports and six airports in this part of Greece. The priority in southern Greece is the Peloponnese railway network, characterized by its metric gauge systems and an extraordinary landscape with numerous antique monuments, which provides the option of introducing a specific type of tourist trains, i. e. cruise trains.

Fig. 17: The model of a new Central Railway Station in Athens / Source: George Pantelas 2014

In the area of the Athens agglomeration, there are several important nodes: 1) the El. Venizelos airport (in the eastern part of the metropolitan area), 2) the SKA junction (connecting both the eastern and western as well as the southern and northern parts of the agglomeration), 3) the Thriassio Pedio freight hub (in the western part), 4) the Neo Ikonio port (new freight port built by COSCO), 5) Piraeus – both port and railway station, and 6) the Central Railway Station of Athens (Larissis station). The most recent achievement relates mainly to the Neo Ikonio–Thriassio Pedio freight line (financed by COSCO), while most of the other projects are funded by the EU (Pantelas 2014; Zartaloudis 2016). Larissis station should serve 11 tracks, as presumed by the EU project proposal; currently, this is in a process of stagnation, due to the fact that the line between the SKA station and Piraeus has not been electrified yet. The highest frequency of the trains (38 pairs/day, 2 pairs/hour) is on the line between the El. Veni-

zelos airport and Plakentias, a junction with the Athens metro line; the second highest frequency is on the line between the airport and Liossia station, from where 11 pairs/day travel to Larissis station; this obviously shows the need for better connectivity between the center of Athens and the airport. Larissis station needs to be upgraded to serve as the main station of the Greek capital (Fig. 17).

Hence, the main priorities regarding the improvement of the railway network in the Athens agglomeration area are: 1) electrification from the SKA station to Larissis station, officially finished in February 2017, 2) final works on the freight station (shunting yard) Thriassio Pedio, which is directly connected to the freight port of Neo-Ikonio, and 3) electrification from Larissis station to Piraues, finished end of 2017.

Integrated urban and spatial development in the central part of Athens is still a challenging task (Perić 2016). This was particularly highlighted after 2005, when the oldest railway station in Athens (Peloponnese station) was closed. This happened because the metric gauge system – the one operating from Piraeus, via Peloponnese station, toward the peninsula of Peloponnese – was abandoned. The standard system (1.435 m broad tracks) was introduced from Larissis station towards Piraeus. However, Larissis station, although placed in the vicinity of Peloponnese station, has never been considered the main city station in the true sense of the word. On the contrary, the SKA junction appears to be the most important node in both south-north and east-west directions. Moreover, Larissis station is placed on the edge of the central core of the city of Athens and is not so well connected to the rest of it (there is only one metro line, while the idea of contructing a tram line from Larissis station leading down to Piraeus was abandoned). Finally, the area in the vicinity of Larissis station is not covered by the main city plan. Namely, the Urban Integrated Plan of Athens covers the eastern neighborhood of the station, the Eleonas area (a great brownfield site) and Plato's academy (cultural park) related to the western neighborhood; however, the catchment area of the station itself is seen as a barrier and not a binding node for two central parts of the city. Nowadays, the development of the metro network is prioritized over the upgrade of railway infrastructure (Evmolpidis 2016).

4 Concluding remarks

Transport improvements have to be combined with other factors for growth to take place. Spatial planning seems to be a useful instrument in achieving such a goal (EC 2012). This applies even more for rail transport, which fits extraordinarily well with the basic concept of sustainable spatial development – 'redevelopment before new development' (Scholl 2012, 2016a). An attractive, well-connected public rail transport system is the backbone of any settlement development in which the transformation of the building stock has priority over the further consumption of valuable cultural landscapes (Perić/Scholl 2017b).

Achieving sectoral compliance between various domains (in this case transport and spatial planning) is, however, not enough to address the challenges of corridor development. Creating a transnational strategy on corridor development involves initiating

and strengthening cooperation at various levels and among different stakeholders: first, there is a need to consider different territorial levels as equally important for the development of a corridor; then, administrative bottlenecks among various institutions within a nation state and, more importantly, between individual states have to be overcome; finally, horizontal cooperation between different disciplines and conflicting sectors (public, private, civil) needs to be strengthened.

In practical terms, there are several examples that hinder transnational corridor development (Dühr/Colomb/Nadin 2010). Firstly, funding for such transnational efforts must be provided from the EU side. Further, what prevails is the dominance of competition, rather than cooperation, particularly at national and supranational levels. Namely, there is a lack of national political support and understanding for transnational issues as the results of transnational development are not usually instantly visible and demand that efforts be made in the long run: e.g. in order to gain material, physical benefits such as constructing the missing railway link between two nodes on the corridor, it is first necessary to establish effective cooperation among the parties involved. As political terms are limited to several years, transnational initiatives which span several decades are beyond politicians' planning spectrums. Similarly, there is a lack of efficient governance platforms – both external and internal. Corridor management demands efficient cooperation among different administrative bodies and sectoral parties. From an external point of view, the European grouping of territorial cooperation (Regulation (EC) 1082/2006) seems an important mechanism for coordinating the manifold interests, conflicts and demands brought by the various stakeholders involved. However, what remains a challenge is creating a similar body within the nation states along the corridor that will address transnational and intergovernmental issues. A lack of human capacities combines with financial constraints to prevent the efficient operation of such a body. The role of spatial planners as mediators and facilitators for the complex demands of transnational strategy-making therefore comes to the fore.

In order to establish the interconnections between transport, spatial development and broader socio-economic context as a background within which all developmental processes are deeply embedded, there is a clear need for spatial planners to understand and coordinate integrated spatial and transport development at various levels: transnational/macro-regional, national/regional, and local. The key findings for each of these levels related to the OEM Corridor are summarized below.

1 **Transnational level.** Improving conditions along the OEM Corridor contributes to better territorial cohesion along this axis, thus reducing the gaps between western and eastern Europe. Nevertheless, the challenges are numerous: in terms of the economy, the countries along the corridor have a 21% lower performance than those of western Europe, while the traffic analysis shows that performance along the corridor is even 50% lower. Finally, a third of the European population lives along the corridor. However, recent global incentives in various infrastructural and spatial development projects (e.g. BRI) are a clear sign of the hidden potential that the OEM Corridor offers for the near future.

2 **Regional level.** In addition to historical differences between the countries on the corridor route (i.e. only Germany, Austria and Greece were not the part of the Soviet bloc), there is also a high discrepancy between the corridor Member States today. Germany is still one of the leading European countries in economic terms. However, Greece is faced with recent economic downturn, Romania and Bulgaria are dealing with numerous problems despite their joining the EU, and Serbia is still trying to fulfill all the necessary pre-accession conditions. The fact that the countries along the Western Balkan branch of the corridor still face fundamental political issues that prevent them from becoming EU members, motivates global players (Russia, China, UAE, Turkey) to pursue their own interests in the area. Keeping the unfavorable economic situation as well as the obsolete infrastructural network in mind (e.g. in some parts of Serbia and North Macedonia train speeds are only 40 km/h), it is no surprise that the Balkan countries welcome foreign support, though ad hoc solutions usually produce spatial degradation in the longer run.

3 **Local level.** The main differences are again observed between the cities along the northern part of the corridor and the hot spots in the south. The 'best practice' examples of integrated spatial and transport development are found in the cities of Hamburg, Berlin and Vienna. These cities succeeded in making certain transport hubs (ports or railway stations) more than just transport junctions. Moreover, such transport hubs brought a completely new incentive for spatial development to their catchment areas, too. In the case of recent urban development in Belgrade or Athens, no strategic approach was applied. Namely, although the Belgrade Waterfront project in Belgrade or Larissis Station project in Athens are not only of city-level, but also of regional and even national importance, the plans for their improvement lack a clear vision, step-by-step (multi-phase) approach, and, most importantly, involvement of all the relevant parties.

Keeping the above in mind, it is clear that the OEM Corridor is the most diverse, and thus the most challenging of the Core Network Corridors. This diversity stems from various historical circumstances, as well as the complex present situation, particularly when referring to its Western Balkan branch, thus complicating any cooperation. Nevertheless, the only solution for overcoming the current barriers and, more importantly, for boosting future prosperity and preserving peace in the area (that not that long ago suffered from the second greatest war in recent European history) is to pursue transparent cooperation among the corridor states. Here, official EU membership should not be understood as an eliminatory criterion. More precisely, the only certain way to move forward and secure long-term stability and progress along the OEM axis is with intrinsic effort for the joint dissemination of knowledge, know-how and best practices, with EU bodies playing an important role as facilitators in such a process. Concrete infrastructural tasks can be a first step to activate the large potential of the OEM Corridor and thus bridge the gaps to make Europe truly 'united in diversity'.

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